French King Bridge
Spanning the Connecticut River on State Highway 2
Erving (Gill)
Franklin County
Massachusetts

HAER No. MA-100

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

FRENCH KING BRIDGE
HAER No. MA-100

Location: Spanning the Connecticut River on State Highway 2, about six miles east of the Town of Greenfield, between the towns of Erving and Gill, Franklin County, Massachusetts
UTM: Millers Falls, Mass., Quad. 18/705360/4718930

Date of Construction: 1932

Structural Type: Riveted steel deck arch bridge

Engineer: George E. Harkness, Bridge Engineer (MDPW)
Albert E. Kleinert, Jr., Asst. Structural Engineer (MDPW)

Fabricator/ Builder: McClintic-Marshall Construction Co., Pittsburgh (steelwork)
Simpson Brothers Construction Co., Boston (substructure)

Owner: Massachusetts Department of Public Works, Boston

Use: Vehicular highway bridge

Significance: The French King Bridge is one of four known steel deck arch bridges in Massachusetts identified in the Massachusetts Department of Public Works (MDPW) database, and has the sixth longest span of all the bridges in the state under MDPW purview. It is of engineering interest as an unusual development of the uncommon three-span, "cantilever arch" bridge type, in that definite reactions were jacked into its steelwork at the conclusion of construction, resulting in a bridge which is structurally continuous across four supports. The bridge was the crucial link in the establishment of a safe and efficient highway, which replaced a very dangerous section of road between Erving and Greenfield in the early 1930s.

Project Information: Documentation of the French King Bridge is part of the Massachusetts Historic Bridge Recording Project, conducted during the summer of 1990 under the co-sponsorship of HABS/HAER and the Massachusetts Department of Public Works, in cooperation with the Massachusetts Historical Commission.

Lola Bennett, HAER Historian, August 1990

Description

The French King Bridge rises 135' above the level of the Connecticut River, and spans a narrow gorge just above the Connecticut's confluence with the Millers River. The bridge itself is a 782-foot, riveted steel, three-span continuous spandrel-braced deck arch, resting on two concrete river piers and two concrete abutments. It has a parabolic lower chord, and a very slightly arched upper chord, which are connected by a series of verticals and diagonals patterned after the Pratt system. The trusses, spaced 41' apart and divided into thirty-four panels each, are identical and are 782'-0" long between the end pins, and 460'-0" long between the river piers. All truss members are built up of plates and angles, connected with lacing and tie bars. The vertical truss members support plate girder floor beams, on top of which are rolled I-beam stringers and a reinforced concrete deck. The deck carries a 40'-wide roadway and a 6'-wide sidewalk on the north side of the bridge. At the piers, the trusses are fixed to steel shoes by means of huge steel pins. At the abutment ends of the bridge, the trusses are carried on rollers enclosed in protective steel boxes. Concrete pylons extend upward from the abutments, above the level of the roadway, to form the portals of the bridge. These pylons have decorative Art Deco-style paneling on their outer surfaces, and are stepped at the top. On top of each pylon is an ornamental, Neo-Classical, wrought iron electrolier with decorative lanterns on either side, and an eagle on top. A decorative iron fence runs along both sides of the deck, and is bolted to steel castings set in the concrete of the sidewalks. (See Figure 1 and copies of original plans and historic photos in field file.)

The French King Legend

The French King Bridge derives its name from a natural landmark, long known as the "French King Rock," located about a quarter-mile upstream from the bridge. Today, only the top of the rock is visible above the surface of the river, but in the mid-nineteenth century, prior to the construction of a dam at Turners Falls, this rock was one of the most conspicuous landmarks in the river, rising over 16' above the surface of the water.

Legend has it that during the French and Indian War (1754-1760), a party of Indians led by a French officer came down the river on a scouting expedition, their objective being to find a desirable point to launch an attack. They arrived in the vicinity of the rock as night fell, and made camp on the bank opposite it. The officer, wishing to make note of a fixed location in his report, staged a ceremony christening the rock in honor of the French king, Louis XIV.

It is interesting to note that this legend began a chain reaction of "French King" designations in the area, all named after a man who never set foot on American soil. The first official designation was that of the French King Bridge and the French King Highway, in 1932. These were followed, in the 1950s, by the French King Restaurant, the French King Motor Inn, and the French King Bowling Alley.

Massachusetts Turnpikes and the Mohawk Trail

The highway known today as the Mohawk Trail, of which the French King Highway is part, is a section of State Highway 2 running from the Connecticut River, just east of Creenfield, to Williamstown, on the New York State border in the northwestern corner of Massachusetts.(See Figure 2.) This road traverses a part of the state that is famous for its beautiful scenery and its association with native American Indians.

Ceographically, the northwest section of Massachusetts is divided by the Hoosac Mountain Range, with the Hudson Valley to the west, and the Connecticut Valley to the east. It was this mountain range that separated two powerful tribes of Indians prior to the establishment of English settlements, but "the coming together of the Indian tribes in war, and later for the purpose of peaceful alliance, eventually resulted in [a] well defined trail over the barrier."[1] Because Indian trails, as a general rule, followed the natural grades of the landscape, they often later became roads for traders and settlers. In the case of the Mohawk Trail, at least two early roads have been documented that followed on, or near, the course of the old Indian path--the first, a rough foot path, marked out by Elisha Hawley in 1753; the second, a road laid out by Samuel Rice in 1764.[2] After the close of the Revolutionary War, "to meet the exigencies of increasing business and population, and the general poverty of the towns and counties,"[3] the establishment of privately-owned "turnpikes" became commonplace.(See Figure 3.)

Chartered March 8, 1797, the Second Massachusetts Turnpike was authorized to build "from the west line of Charlemont, in the county of Hampshire, to the west foot of Hoosuck (sic) Mountain in Adams, in the county of Bershire."[4] This route over Hoosac Mountain followed approximately the line of the old Indian trail. Three years later, the Ceneral Court of Massachusetts granted a charter to the proprietors of The Fifth Massachusetts Turnpike, authorizing them to lay out a toll road from Greenfield and Northfield to Leominster. This road, "the most extensive and ambitious project sanctioned by the state,"[5] was the first road to open a direct line from east to west across Massachusetts. A few years later, in 1802, a group of men from Greenfield chartered The Fourteenth Massachusetts Turnpike, to complete the section of turnpikes from Boston to the Hudson River, essentially by connecting the Fifth Massachusetts Turnpike with the Second Massachusetts Turnpike. Apparently, however, the promoters ran out of money fairly early in the project, as the road was constructed only as far as Shelburne and never completed.[6] Eventually, the other turnpike corporations dissolved, and the roads were turned over to the counties as free roads.

Although these roads were seldom repaired, and journeys on them were long and often fraught with peril, they served their intended purpose through the nineteenth century. Shortly after the turn-of-the-century and the advent of the automobile, the inadequacies of the old roads for motorized vehicles became evident, and the Massachusetts Highway Commission made plans to improve all the state's roads, including the section of highway from Creenfield to North Adams. Work was begun in September of 1912 and completed in November of 1914, at a cost of $350,000.[7] At the opening ceremonies, October 24, 1914, the highway was officially dedicated as "The Mohawk Trail," after the Mohawk Indians of that region.

The Erving-Greenfield Gutoff

Other smaller sections of highway throughout the state were improved in the ensuing years, but political and economic events precluded the planning of projects on such a large scale as the Mohawk Trail project. In the early 1920s, the Massachusetts Department of Public Works was formed under Governor Galvin Coolidge's administration. Among their first priorities was the elimination of dangerous sections of highway throughout the state, the section of road between Erving and Greenfield being one of them. This circuitous section of highway, which wound its way through the villages of Millers Falls and Turners Falls in Montague, had become seriously inadequate for the needs of an increasing volume of heavier and faster vehicles. A state highway engineer of the 1930s described this seven-mile section of road as follows:

> The old highway, beginning a little east of Millers Falls and proceeding west, is on a steep grade with a right angle turn part way down the hill where there is a blind grade crossing of the Central Vermont Railroad. A few hundred feet beyond is a second right angle turn with a narrow bridge only 15 feet wide, over Millers River, leading into the village of Millers Falls, with a third right angle turn and a 9 per cent grade leading out of the village. Beyond this point, the alignment and grade of the road is reasonably good until we reach the village of Turners Falls, where the road descends on a 7 per cent grade with a sharp turn at the foot of the grade, and a few hundred feet beyond a right angle turn with a sharp descent, another right angle turn, then over the canal on a narrow bridge with a railroad crossing just beyond, thence over the Connecticut River on the old suspension bridge with a roadway only 18 feet wide, at the end of which is a very dangerous right angle turn and a long steep grade uphill into Greenfield."[8](See Figure 4.)

Department of Public Works engineers studied a number of plans to eliminate these hazards, most of them aimed at using as much of the existing highway as possible, but eventually each proposal was determined to be unsuitable for one reason or another. Ultimately, it became clear that the only sensible plan was to eliminate the entire route through Millers Falls and Turners Falls, and build a new section of highway between Erving and Greenfield. The major obstacle in this plan was bridging the Connecticut River at a point above Turners Falls, a less-than-ideal location because of the steep, 150-foot banks on either side of the river. After looking at several plans, the engineers decided to cross the river with a bridge at the height of the hills on either side, about 135 feet above the water. When completed, the entire project would include the construction of about six miles of new state highway, a highway grade separation, a bridge over the Central Vermont Railroad and the construction of a large steel arch bridge over the Connecticut River.[9]

The Erving-Greenfield cutoff project was one of a considerable number of highway projects undertaken by the state in the early 1930s. Most of these projects, including the Erving-Greenfield cutoff, received funding under the

Federal Emergency Relief and Construction Act of 1930, which provided public works jobs for the unemployed. Additional funding was provided by Chapter 122 of the 1931 Acts of Massachusetts, which increased the gasoline tax and provided "a program for the acceleration of state highway and building construction, in order to alleviate the present unemployment emergency."[10] Under this act, the Department of Public Works launched a major road-building program throughout the state, constructing over 585 miles of new highway and reconstructing 383 miles of old highway, between 1930 and 1933.[11]

During the summer of 1931, the contracts for the Erving-Greenfield cutoff were awarded to Kelleher Corporation of Montague, Massachusetts (for the western section, from Greenfield to the Connecticut River) and to Lawton Construction Company of Providence, Rhode Island (for the eastern section, from the Connecticut River to the road to Millers Falls, just east of the road to Northfield, now Highway 63). Work on these two contracts commenced immediately, and the highway was completed in July of 1932.

The French King Bridge

George E. Harkness, an engineer at the Massachusetts Department of Public Works in Boston, drew up the plans for the bridge over the Connecticut River. These were completed in August, and later revised in October.(See Figure 5, and copies of plans in field file.) Albert E. Kleinert, Assistant Structural Engineer at the Massachusetts Department of Public Works in 1931, stated that in selecting the type of bridge to be erected on the chosen site, there were a number of governing factors: 1.The level of the new road was to be carried across the gorge at the height of the surrounding hills, an elevation of about 135 feet above the water. 2.The banks on either side of the river were high and steep, and a road had been built into the east bank at a grade approximately 30 feet above the water level. 3.Rock, suitable for the foundations, was found within a few feet of the surface of the ground. 4.The bottom of the river was uneven and rocky, and the depth of the water varied, being 34 feet at the deepest point. 5.The river was comparatively narrow at this location, and any reduction in the waterway was prohibited because the river was used as a source of hydro-electric power[12]. "With these conditions in mind," Kleinert said,

> the endeavor was made to develop a bridge which not only fitted the site, but which could be erected by cantilever construction, since the deep water, rocky river bed, and the swift current discouraged the use of falsework in the river. The result of our studies is a steel deck structure, continuous over four supports, two of which are abutments placed at the ends of the bridge, high on the banks, and the other two are piers placed at the edges of the river. ...In naming the type of this structure we have used the term "steel continuous spandrel braced arch," because it is a steel spandrel braced arch between the piers, and is continuous to each abutment where it receives vertical support.[13]

Construction

On September 1, the substructure contract for the abutments, pylons and piers, was awarded to Simpson Brothers of Boston, for $102,262, and work commenced immediately. Kleinert states that the contractors experienced "no unusual difficulty" in executing their contract. Nearly all the excavation work was done above the level of the water, and involved the removal of only a few feet of earth. The pouring of the concrete and placing of reinforcing steel occurred simultaneously on both sides of the river. "With exceptional speed and efficiency," the contractor completed the project in January of 1932.[14]

Bids for the superstructure were opened October 27, 1931. McGlintic-Marshall Construction Company, of Pittsburgh, Pennsylvania, received the contract on November 10, being the low bidder at $256,910.30. Under the direction of H.G. Reynolds, foreman for the McClintic-Marshall Company, work on the superstructure began in April of 1932, at the Erving (east) side of the river. The shore spans were built upon falsework, made up of some steel members from the Gill end of the bridge. After the steel at the piers had been placed, the erection proceeded by cantilevering out over the river, with the ends of the trusses tied down at the abutments.(See Figures 6-8.) The individual steel members were moved into place by means of a derrick with a 75-foot boom attached. This derrick, carried on a wheeled framework, ran along a track laid on a plank platform on top of the stringers. Trucks, hauling the steel from the freight yard at the Boston & Maine station at Mount Hermon, drove right out onto the bridge to the derrick, at which point the steel was unloaded and placed into position in the bridge, "thereby eliminating all storage and rehandling at the site of the work."[15] Construction proceeded steadily, two panels at a time. The local communities, of course, observed all of this with great anticipation. On May 4, the Greenfield newspaper reported:

> The new bridge at the French King rapids is attracting the attention of local people and many Northfield people are making trips to view the erection of the steel now going on. The work is being done on the Erving side of the river and steel has now been erected to a point where it is expected the pier will be reached Wednesday.
>
> The bridge, which is of cantilever construction will be built out on the Erving side to the middle of the river which will probably take until June 1, according to Henry Hazzard, the engineer in charge. Work will then be begun on the Gill side and when the two sides have been built out to the middle of the river they will be joined. This will be the climax and the moment of greatest interest in the process of erecting the bridge.
>
> The work is to be completed before Sept. 15 but with favorable conditions it may be finished sooner. Thirty skilled steel workers are now at work on the bridge and riveting began on Monday.[16]

By the end of May, the contractors had completed the cantilever on the Erving side of the river, and moved their equipment to the opposite side, to begin the second half of the erection. The Gill side of the bridge was constructed during the month of June, and went fairly steadily, until the end of the month when a rash of accidents occurred. While the company took every possible precaution, including hiring a lifeguard, who stayed in a boat below the bridge, the workers on the bridge were in almost constant danger. The newspaper reported that one worker crushed his hand, several were injured by falling rivets, and one riveter, Charles Spat, fell 115 feet to his death when his wrench slipped.[17]

Despite injured workers and delays on account of rain, however, the construction progressed, and on the afternoon of July 7, 1932, the two halves of the bridge were joined in the middle, when the last chord on the arch on the downstream side was bolted into place.(See Figure 9.) This, of course, was the most difficult phase of construction, as the two cantilevers had to meet precisely. The newspaper described this engineering feat as follows:

> One of the most astounding feats of the construction of the French King bridge over the Connecticut river, yet one so ordinary that the engineers failed to let the general public in on the secret, was the movement Thursday of 1250 tons of steel a space of five inches.
>
> When the engineers set out to erect the largest and highest bridge in the Massachusetts highway system, they planned the Erving half to rest solidly from the beginning on its stone abutment.
>
> The Gill half, just completed, had a calculated deficiency of five inches in length after the two middle panels were in place. At the base of this span were placed powerful hydraulic jacks and the weight and balance of the 1250 tons of steel jutting 230 feet out over the river were so nicely arranged that by operating the jacks the end of the span could be swung up or down, forward or back, so to make the union with the Erving side exact.
>
> The calculations were proven exact Thursday, when engineers from Boston and many other places saw the bridge joined and the final sections of steel riveted into place. This operation is not unusual in bridge building but the scale of the present undertaking attracted the interest of many bridge builders and structural steel men.[18](See Appendix A.)

In mid-July, shortly before the steel work was completed, the concrete work on the deck, curbs and sidewalk was begun. This part of the construction had been contracted to the Ward Construction Company, who sub-contracted to the Bassett Construction Company of Needham. The newspaper described this final phase of construction as follows:

> Forms have already been made and laid for a portion of the roadway across the bridge. A force of men is at present polishing the pylons at the eastern entrance of the bridge. It has been decided to erect a bronze pole of about 15 feet high on each of these

> pylons, on top of which will be a large bronze eagle and at each side of the eagle will be a lantern of the revolutionary period which will be lighted with electricity. The fences will be of cast iron, four feet in height and the posts of the fence will be of cast iron.[19](See Figures 10 and 10a.)

On July 21, the first 115 feet of the deck on the Erving side of the bridge was poured.[20] Forms for the concrete were made of plywood, in sections 4 feet wide and 115 feet long, constructed so they would fit between the stringers. Five panels, or 115 feet, of the deck were poured at one time, and the pourings alternated from one end of the bridge to the other.[21] Despite a few minor setbacks, due to heavy rainfall and lack of forms for the concrete, the contractors completed the concrete work on August 29.[22] The fence was then erected on both sides of the deck. Finally, the steel superstructure was painted, the roadway was paved with asphalt, and the construction of the French King Bridge was complete.(See Figures 11 and 12.)

Bridge Dedication and Celebration

During the construction of the bridge, residents of surrounding communities formed a committee to plan a gala celebration in honor of its opening. There was no doubt that the festivities would be well-attended. As the bridge neared completion, people came from all over to witness the engineering marvel for themselves, and the Greenfield newpaper carried reports of increasing numbers of visitors at the bridge:

> (August 29)--Sunday was the banner day for visitors at the French King bridge. The number of people visiting the bridge was the greatest since the bridge was started and it is estimated that over 5,000 people visited at either end of the bridge.[23]

> (September 6)--One of the largest crowds ever counted since the new French King bridge was started visited the bridge on Sunday and Monday. It was estimated that a trifle over 10,000 people viewed the structure, coming in cars representing the various states in the Union.[24]

> (September 12)--A check was made on Sunday of cars visiting the French King bridge which showed that from 11 o'clock in the forenoon until 5 o'clock in the evening there were over 1400 cars per hour that passed over the bridge. More than half of that number parked their cars and walked out on the bridge and viewed the scenery both up and down the river.[25]

On the afternoon of September 10, 1932, with much fanfare, the French King Bridge was officially dedicated and opened to traffic.(See Appendix B.) A throng of 15,000 people lined the bridge and overflowed to the river banks and fields below. "For more than two miles on either side of the bridge, solidly parked automobiles lined the highway."[26] Numerous state, county and local officials, including Governor Joseph B. Ely, attended the ceremonies. A

concert by the Greenfield military band was followed with speeches by Governor Ely and Frank E. Lyman, Commissioner of the Department of Public Works. The highlight of the day was a mile-long parade of highway transportation progress, which included: a yoke of steers and a cart, a covered wagon, a stage coach, a "one-hoss shay", a horse-drawn freight wagon, bicycles of all kinds, automobiles of all kinds, road builder's equipment, and road maintenance equipment.(See Figure 13.) After the parade, there were outboard motor races on the river, and airplane maneuvers over the bridge by the National Guard.

The profound effect this new bridge and section of highway would have on travelers in Massachusetts evoked the following lines, penned by local historian John A. Taggart, who had written an historical paper for the souvenir program:

> This is a period which has seen wonderful development in transportation; so much so that there is no longer an isolated country or an isolated community. The automobile and the airship have penetrated the former unexplored wilds of the earth. The balloon has searched the mysterious heights of the stratosphere, and the submarine has visited the watery depths of "Davy Jones' locker." Who dares say that the wildest dreams of Jules Verne may not yet come true.
>
> The earth is girdled with steel rails and modern highways beckon where the legions of Caesar, Alexander and Napolean once struggled through mire or over rock strewn heights.
>
> We consider with pride the splendid highway system of Massachusetts. Today we dedicate a magnificent addition to the justly famous Mohawk Trail system. The imposing structure of steel and concrete which here spans the Connecticut river is a noble monument to man's skill and ingenuity. The miles of newly constructed highway which approach the bridge from west and east open up a territory rich in history and replete with views which delight the eyes.
>
> Let us feel assured that coming generations will appreciate that we have builded not for ourselves alone, but also for those who shall people this fair valley after the builders have passed to that bourne from whence no traveler returns.[27]

The bridge was given a first place award (see Appendix C.) as the most beautiful steel bridge in its class for 1932, by the American Institute of Steel Construction, and bears a plaque inscribed as follows:

American Institute of
Steel Construction

Annual Award of Merit
Most Beautiful Steel Bridge
Class B 1932

Simpson Brothers Corporation

The Simpson Brothers company, under the proprietorship of C. Fred and James Simpson, was first listed in Boston directories in 1882. Their advertisements stated that the company did asphalt paving, including, "Streets, Street Crossings, Carriage Ways, Side Walks and Private Walks, Floors in Breweries, Stables, Basements and Laundries of Private Dwellings, Warehouses, Mills, Rinks and Manufactories of every description."[28] The advertisements indicate that at that time, asphalt was a new building material in the United States, as it had to be imported from Europe. Business must have been good during the early years, however, because the company was incorporated in 1899. By the early 1900s, the company, still under the management of C. Fred Simpson, had expanded its operation to include concrete construction and concrete manufacturing. At some unknown point, presumably between 1915 and 1925, the company changed hands, and Charles F. Knowlton was elected president. A 1932 advertisement said that they were "general contractors and builders," specializing in "reinforced concrete construction."[29](See Figure 14.) During the late 1940s and the 1950s, the company was mainly involved in road construction. The company continued to be listed in directories through 1959.

McClintic-Marshall Construction Company

Howard Hale McClintic was born at Lewistown, Pennsylvania, April 9, 1867. His father, Robert Hofferd McClintic, was in the furniture and undertaking business. Howard McClintic received his early education in the public schools and went on to study civil engineering at Lehigh University. After his graduation in 1888, McClintic was employed for a short time by a Pittsburgh engineering firm, and subsequently was engaged by the Shiffler Bridge Company of that same city.

When the American Bridge Company took over the Shiffler Company in 1900, McClintic, along with college classmate Charles Donnell Marshall, went into business for themselves. With the financial backing of Andrew and Richard Mellon, the two men purchased an old steel plant in Pottstown, Pennsylvania, and began to operate under the name of McClintic-Marshall Construction Company, and "ultimately built it into one of the nation's largest independent steel fabricating firms."[30] The company's most well-known projects included: the lock gates for the Panama Canal; the George Washington Bridge over the Hudson River; the Golden Gate Bridge at San Francisco; the Ambassador Bridge at Detroit, Michigan; Salmon Tower and the New York Central Railroad Building in New York; the Civic Opera House and Merchandise Mart of Chicago; and the steel plant for the Tata Iron and Steel Co. of British India.[31]

By 1931, the company was valued at $64,000,000, and had plants at Rankin, Lancaster, Carnegie and Pottstown, Pennsylvania, and at Chicago, Buffalo and Los Angeles.[32] That year, Howard McClintic retired, and the business was acquired by the Bethlehem Steel Company for $32,000,000, although the company retained its name and some of its directors.[33] Several years later, H.H. McClintic died in Pittsburgh, on August 5, 1938.(See Figure 15.)

Conclusion

Since its construction in 1932, the only major repair on the bridge has been a deck replacement in 1955. Today, the French King Bridge is in need of a coat of paint, as well as extensive repairs to the wrought-iron railings, the concrete pylons and walkways, and the deck. After several years of concerted public pressure, the bridge is finally going to be repaired. The legislature has recently passed a bill to increase the gasoline tax, in order to fund a number of public works projects, including the rehabilitation of the French King Bridge.

The French King Bridge is significant as one of four known steel deck arch bridges in Massachusetts, and one of the longest spans in the state. It is of engineering interest as an unusual development of the uncommon three-span, "cantilever arch" bridge type, in that definite reactions were jacked into the steelwork at the conclusion of its construction, making the bridge structurally continuous across four supports. The bridge fabricator, McClintic-Marshall Company of Pittsburgh, was a very significant bridge-building firm in the early to mid-nineteenth century. The French King Bridge was the crucial link in the establishment of a safe and efficient highway across northern Massachusetts in the 1930s, and is a reminder of the great strides being made in transportation technology during that period.

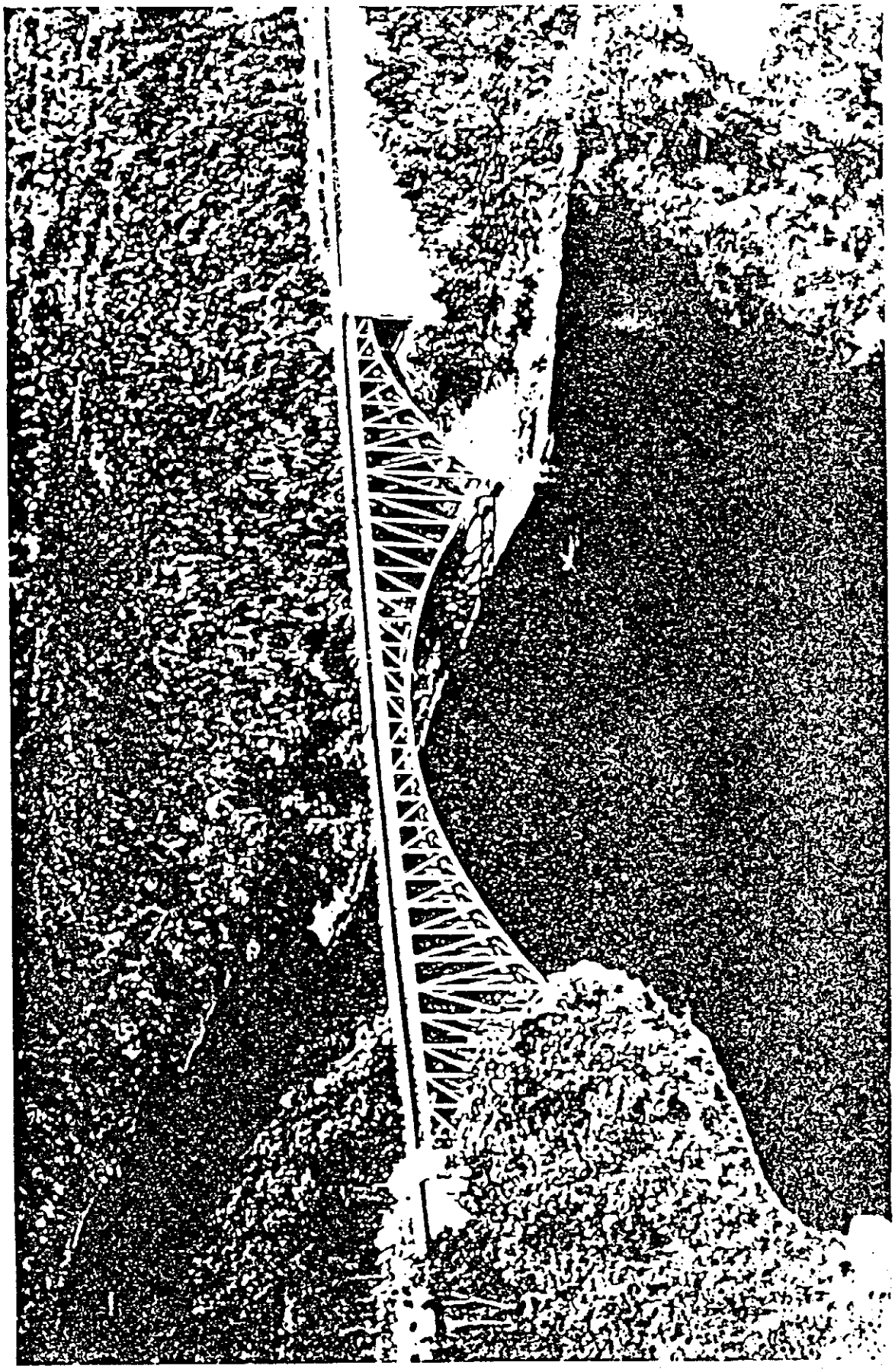


Figure 1. Aerial view of the French King Bridge, 1930s.
(History of the Town of Gill, Stoughton, 1978.)

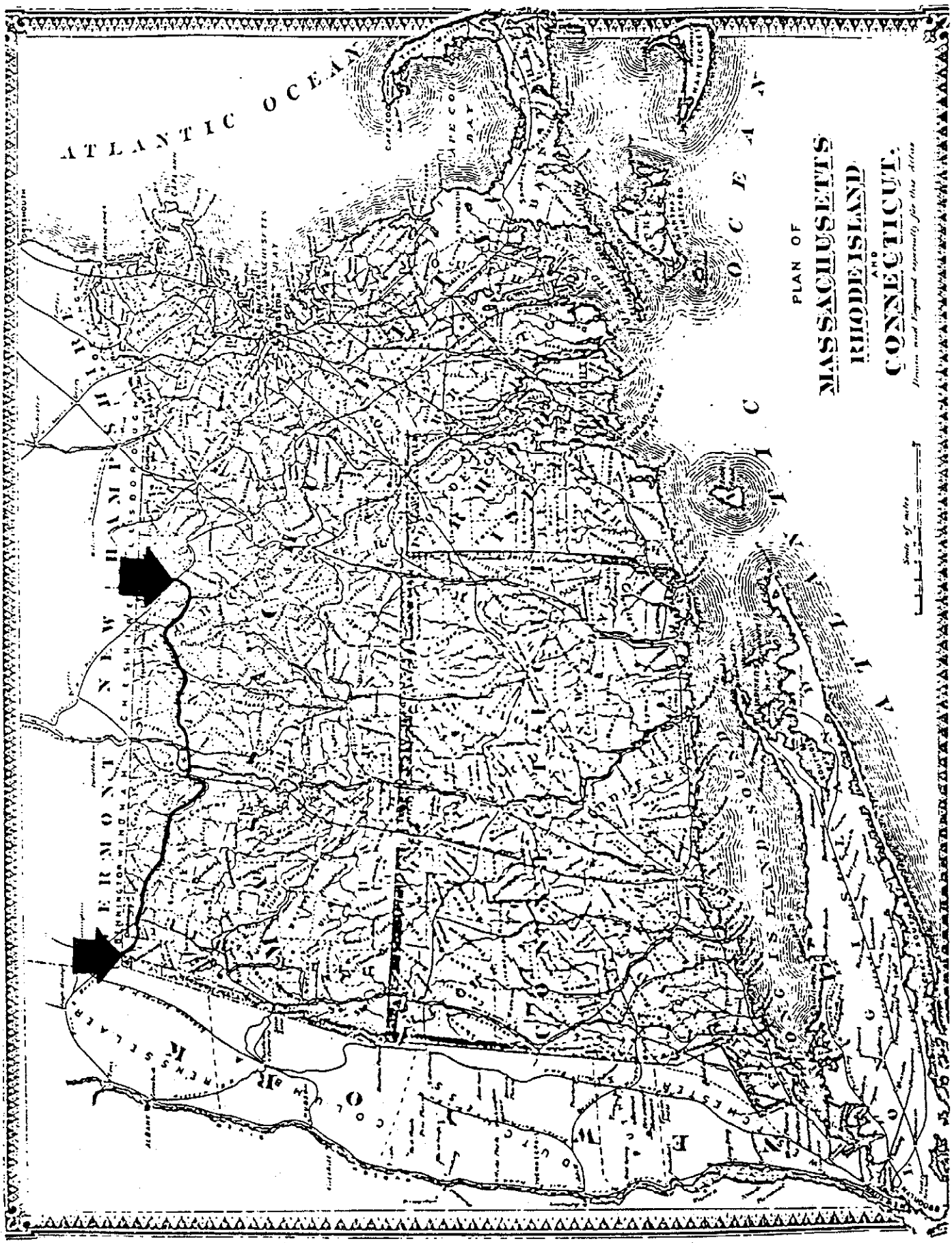


Figure 2. Map of Massachusetts (F.W. Beers, 1870), showing location of the road which would become the Mohawk Trail.

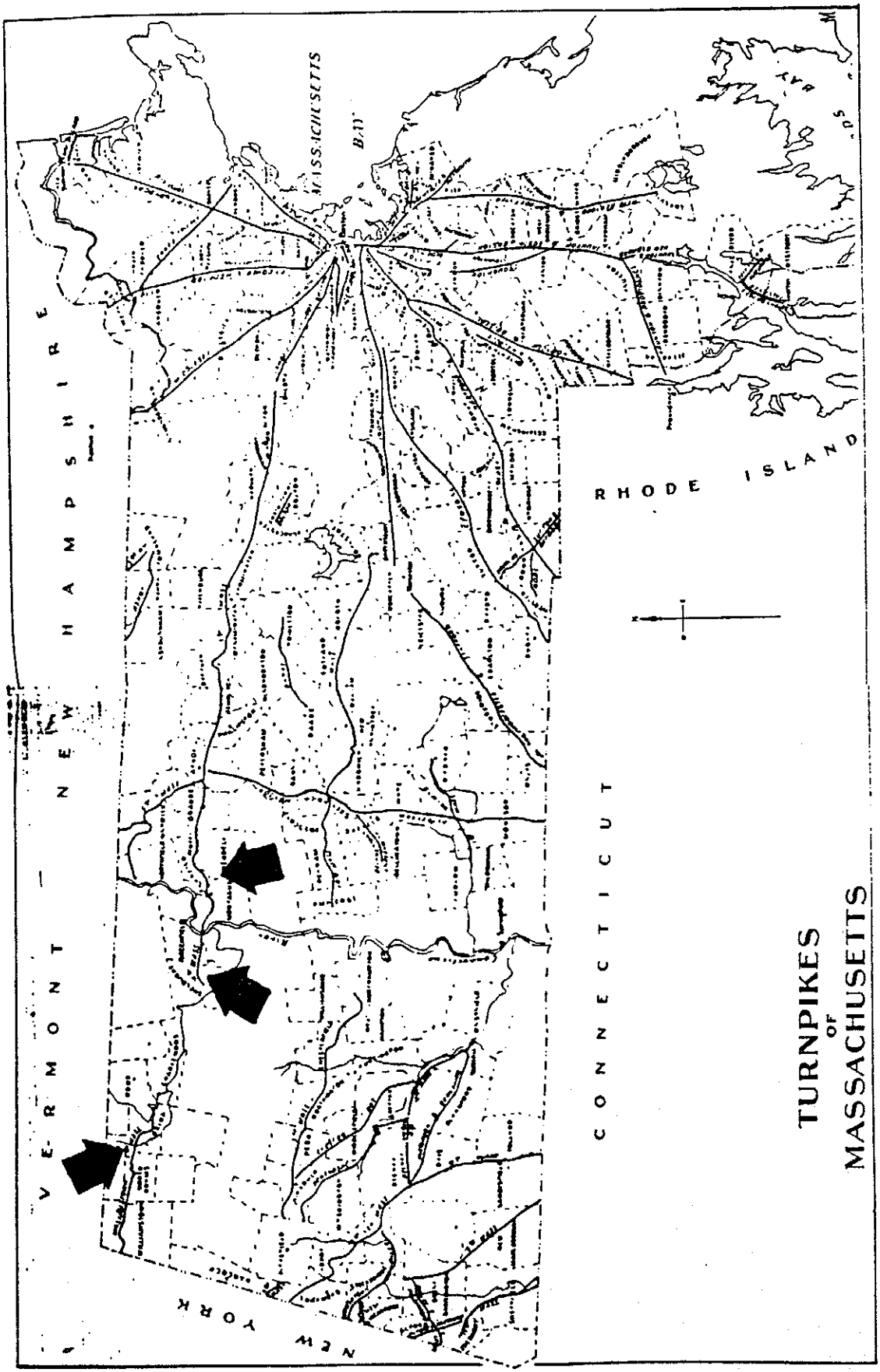
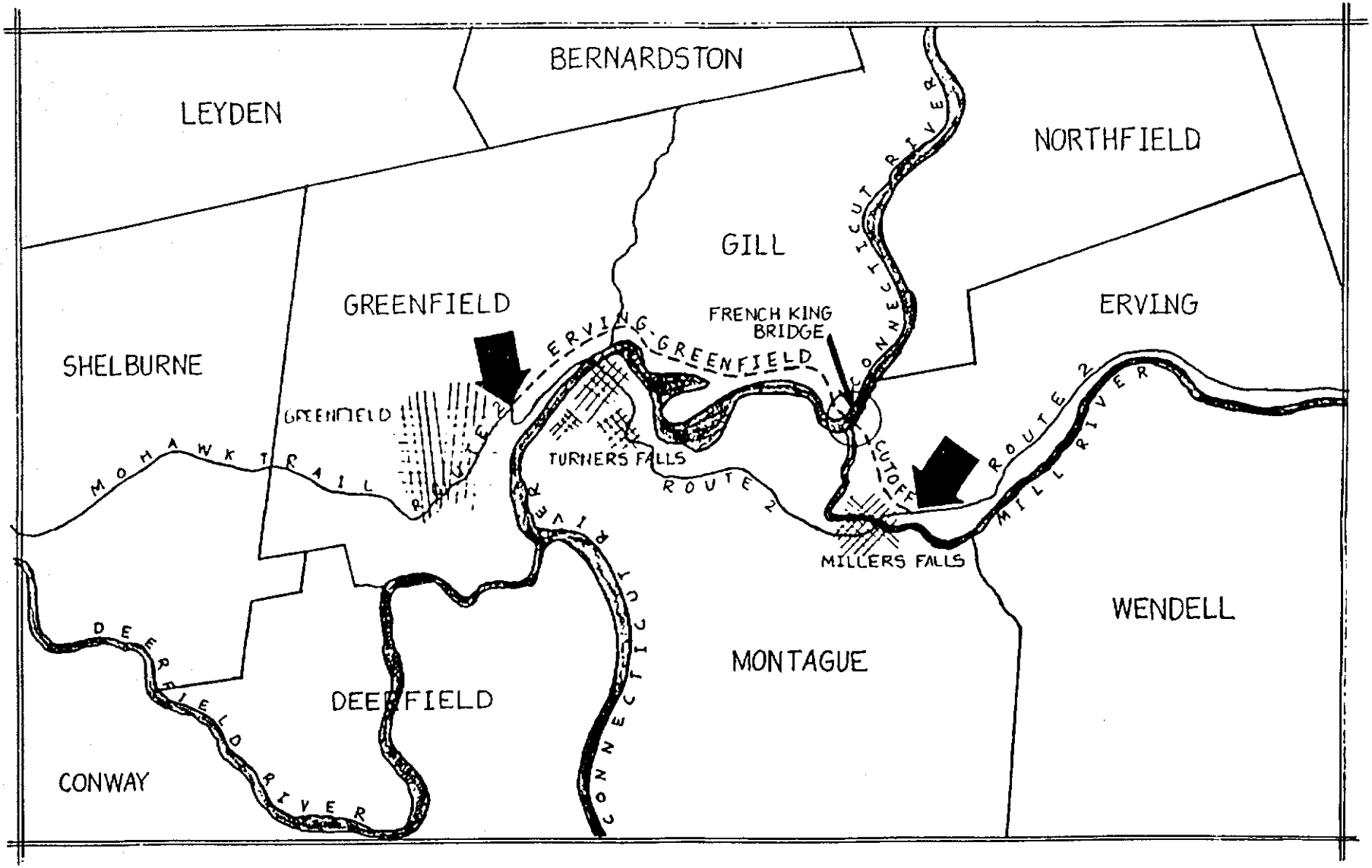


Figure 3. Map of Massachusetts (Wood, 1919), showing locations of Massachusetts turnpikes.



CENTRAL FRANKLIN COUNTY, MASSACHUSETTS
SHOWING LOCATION OF OLD SECTION OF STATE HIGHWAY 2 AND 1932 ERVING-GREENFIELD CUTOFF
(APPROXIMATED FROM HISTORIC MAPS AND DESCRIPTIONS, LMB 1990.)

Figure 4. Map of Central Franklin County, Massachusetts, showing old section of State Highway 2 and location of 1932 Erving-Greenfield cutoff.

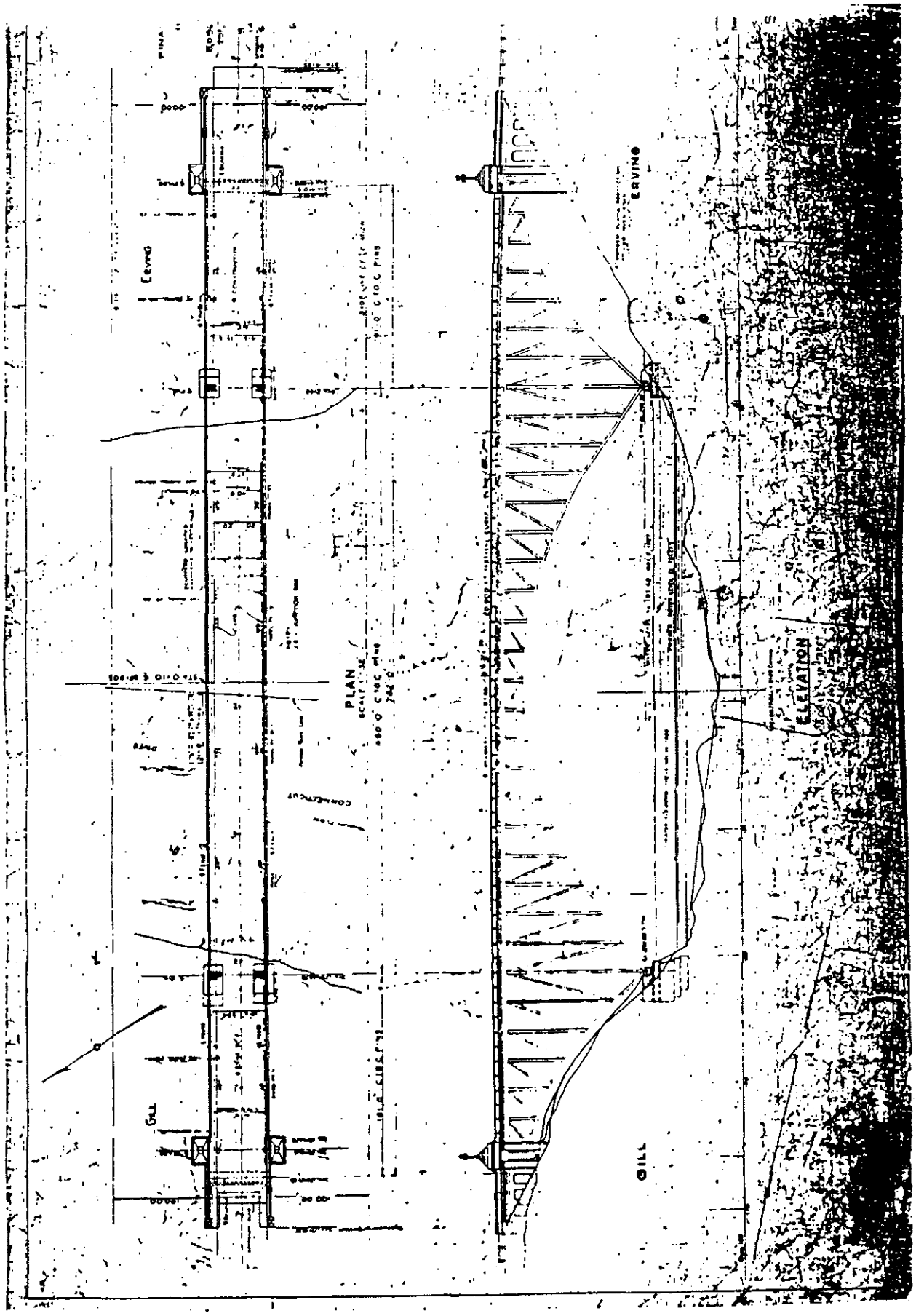


Figure 5. Plan for elevation of French King Bridge.
(Courtesy of Massachusetts Department of Public Works.)

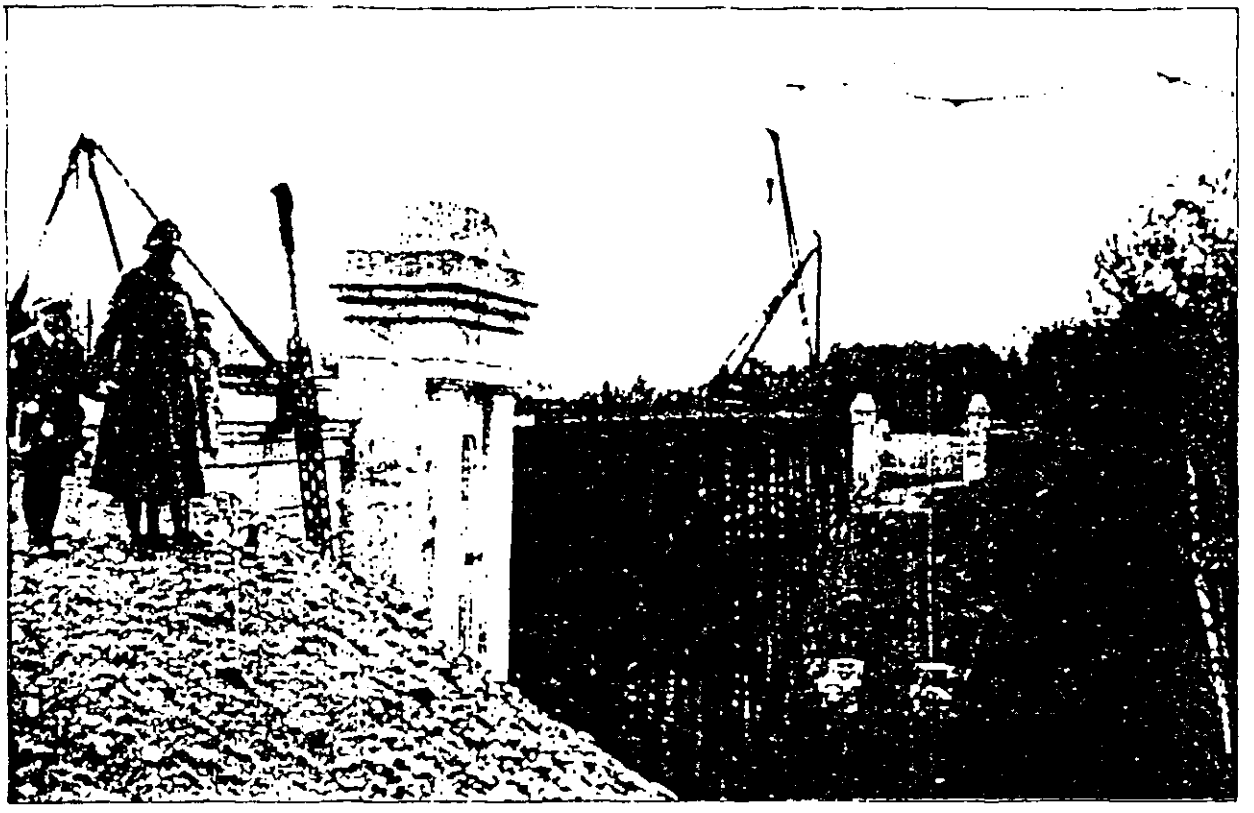


Figure 6. Photo of French King Bridge construction, 1932.
Harry W. Fay, photographer.
(Collection of Dr. Ward M. Hunting, New Salem, Massachusetts.)

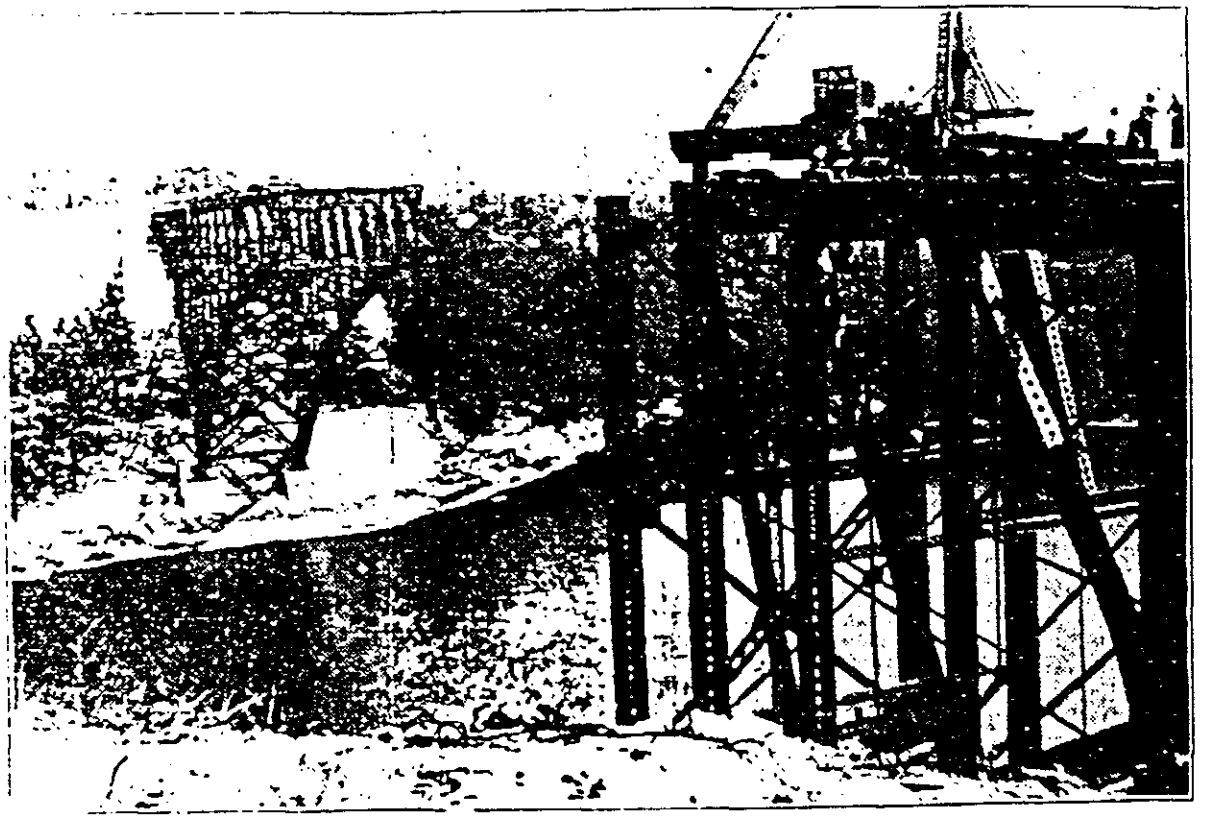


Figure 7. Historic photo of French King Bridge construction, 1932. (Photo courtesy of The Greenfield Recorder, Greenfield, Massachusetts.)

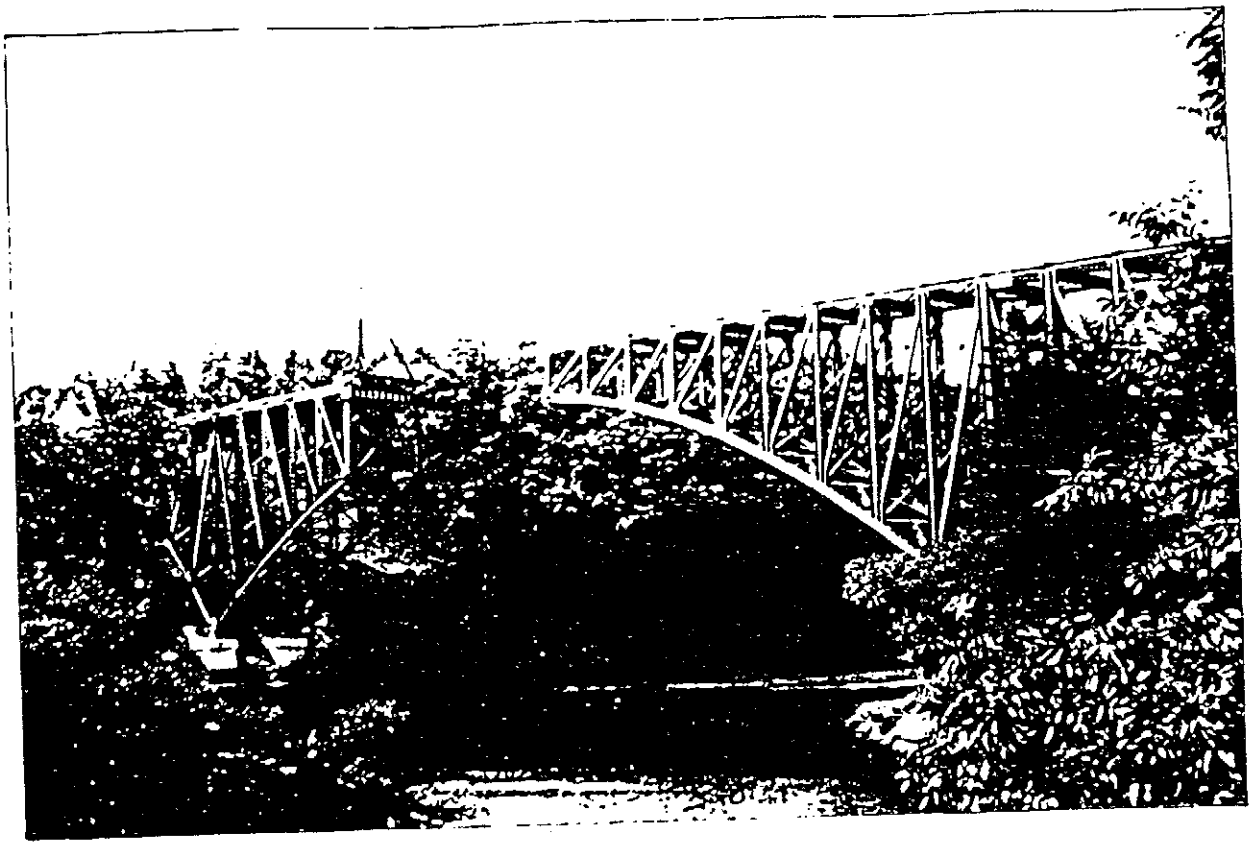


Figure 8. Photo of French King Bridge construction, 1932.
Harry W. Fay, photographer.
(Collection of Dr. Ward M. Hunting, New Salem, Massachusetts.)

Figure 9. Photo of French King Bridge construction, 1932.
Harry W. Fay, photographer.
(Collection of Dr. Ward M. Hunting, New Salem, Massachusetts.)

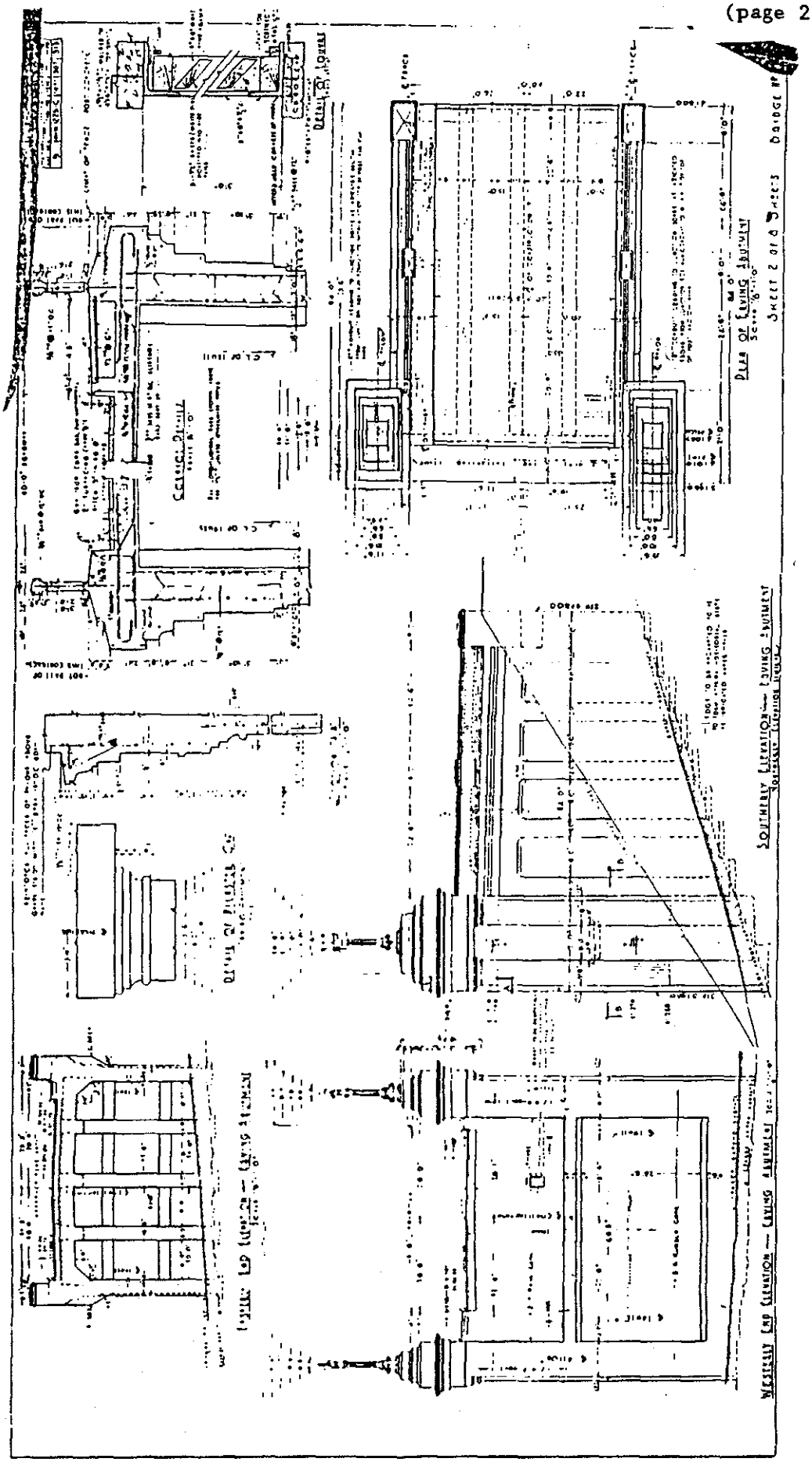
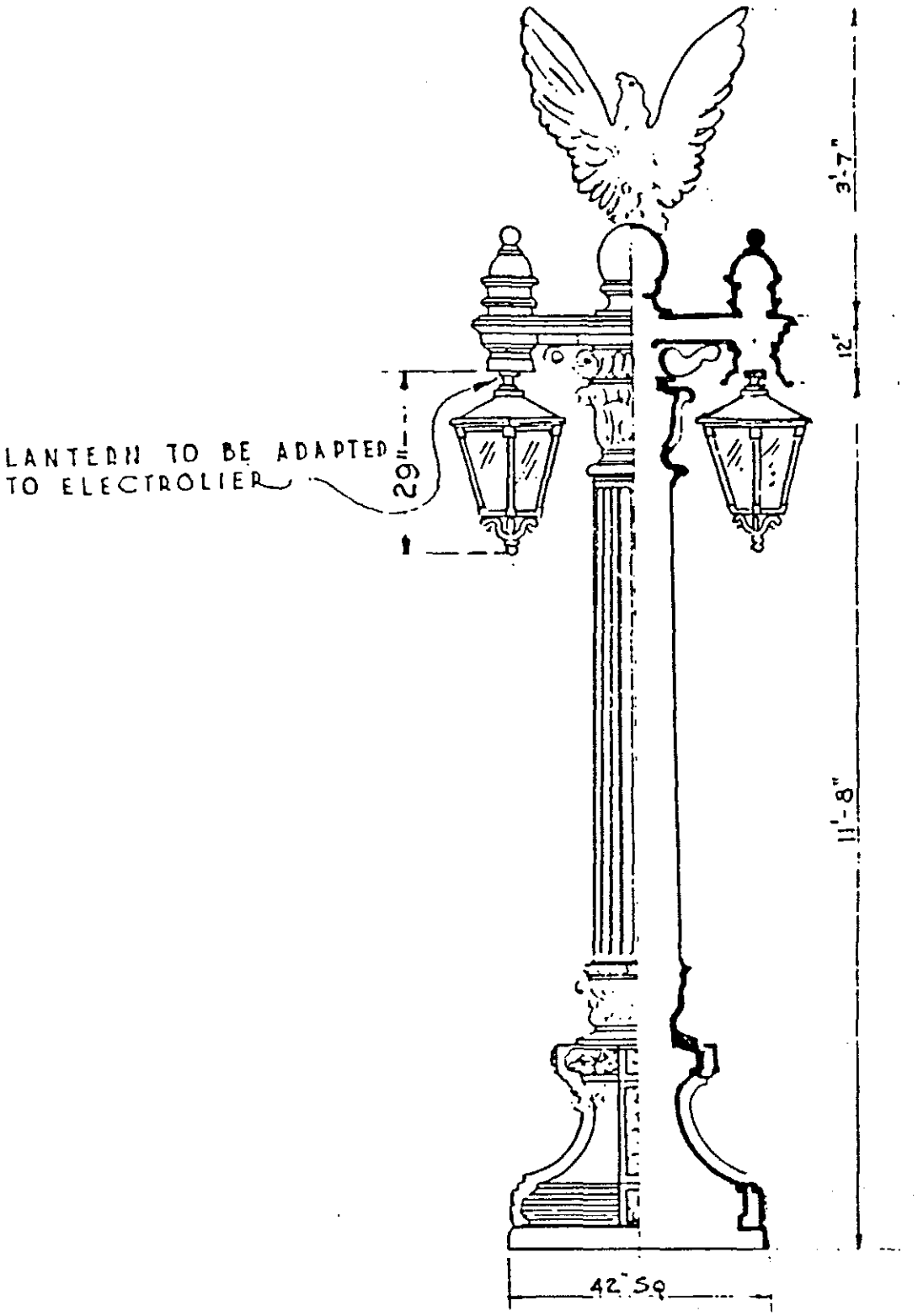


Figure 10. Plan for French King Bridge abutments and pylons, 1931.
(Courtesy of Massachusetts Department of Public Works.)



TWO LIGHT ELECTROLIER
SCALE $\frac{1}{2}$" = 1'-0"

Figure 10a. Detail of plan for French King Bridge electroliers, 1931. (Courtesy of Massachusetts Department of Public Works.)

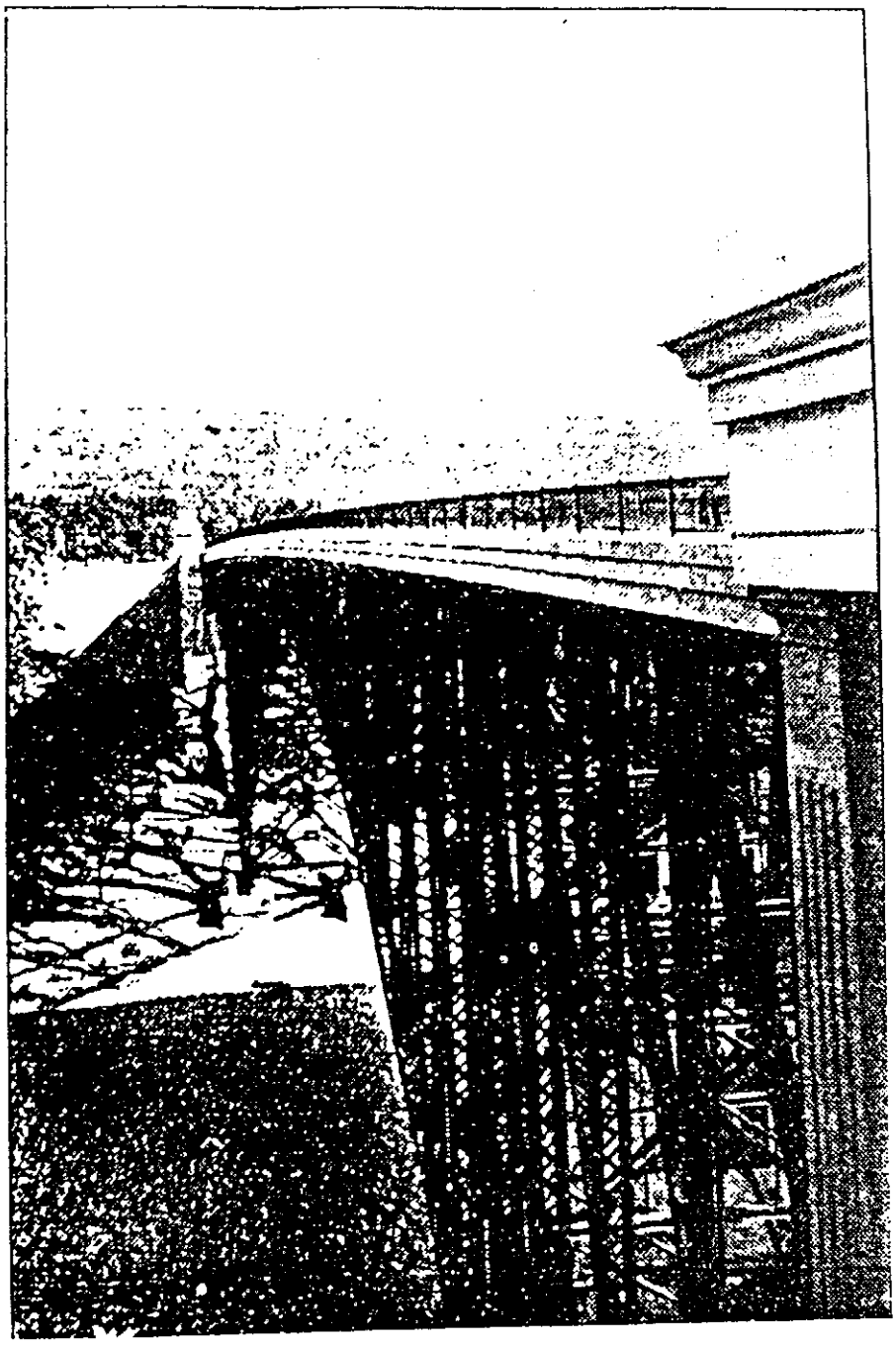
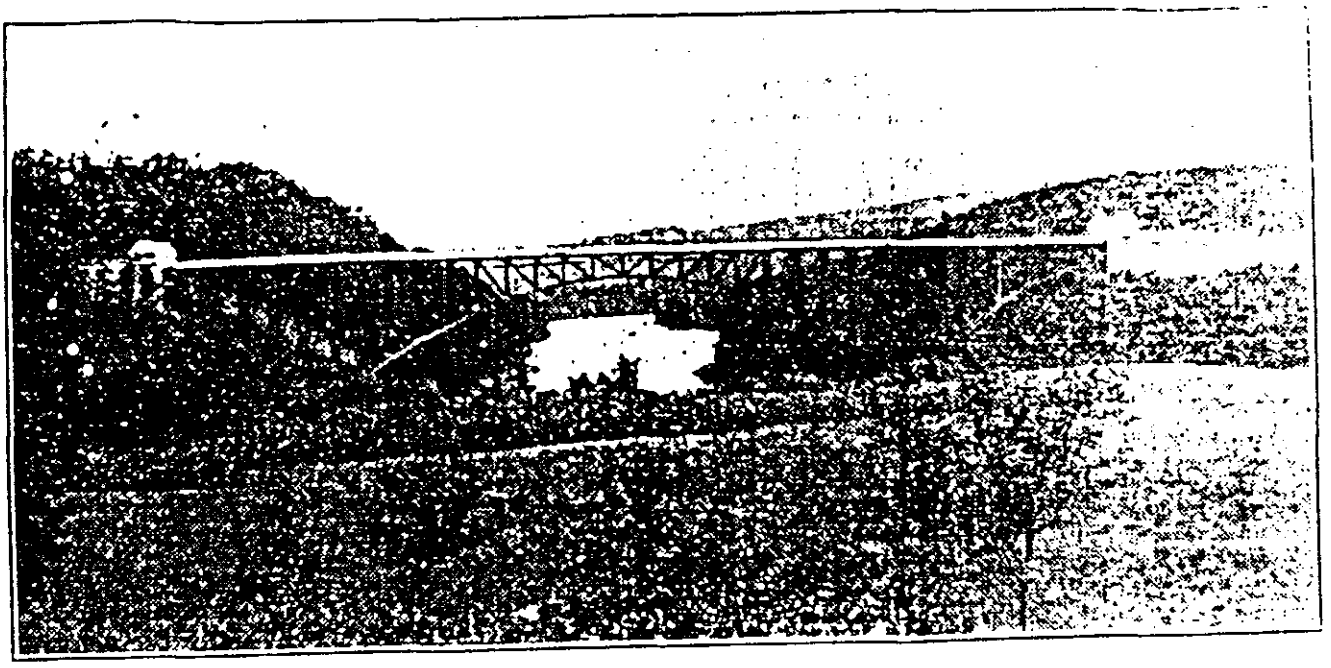


Figure 11. View of completed French King Bridge, looking east from Gill abutment, 1932.
(Photo courtesy of The Greenfield Recorder, Greenfield, Massachusetts.)

THE COMPLETED FRENCH KING BRIDGE



The graceful sweep of the new structure that carries Route 2 over the Connecticut is well displayed in this recent photograph taken from just below where Millers river joins the larger stream

Figure 12. View of completed French King Bridge, looking north from Millers Falls, 1932. (Photo courtesy of The Greenfield Recorder, Greenfield, Massachusetts.)

Figure 13. French King Bridge dedication and celebration, September 10, 1932. Harry W. Fay, photographer. (Collection of Dr. Ward M. Hunting, New Salem, Massachusetts.)

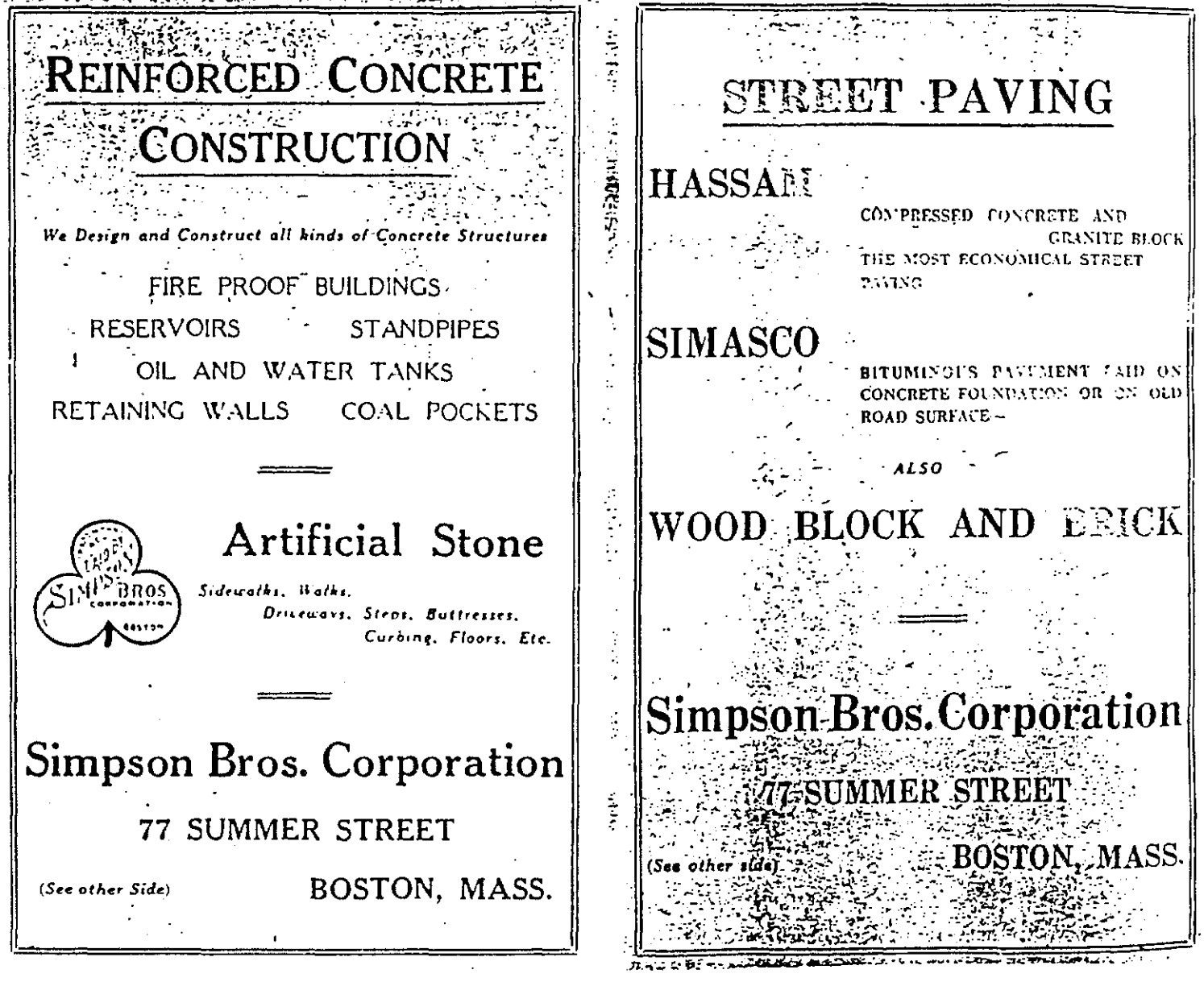


Figure 14. Advertisement for Simpson Brothers Corporation, from Boston City directories.

Figure 15. Portrait of Howard H. McClintic.
(The National Cyclopaedia of American Biography, 1941.)

Half Of New French King Bridge---1250 Tons In All Moved Space Of 5 Inches

Astounding Feat of Construction Performed — Gill Half of Structure Had Been Resting on Hydraulic Jacks and Weight and Balance So Nicely Arranged Union With Erving Side Was Exact — Work Now Being Rushed — Completion Due Sept. 1st

First lower chord of French King bridge in place, making large part of structure. James Kelley of state highway department, resident engineer, in foreground.

One of the most astounding feats of the construction of the French King bridge over the Connecticut river, yet one so ordinary that the engineers failed to let the general public in on the secret, was the movement Thursday of 1250 tons of steel a space of five inches.

When the engineers set out to erect the largest and highest bridge in the Massachusetts highway system, they planned the Erving half to rest solidly from the beginning on its stone abutment.

The Gill half, just com-

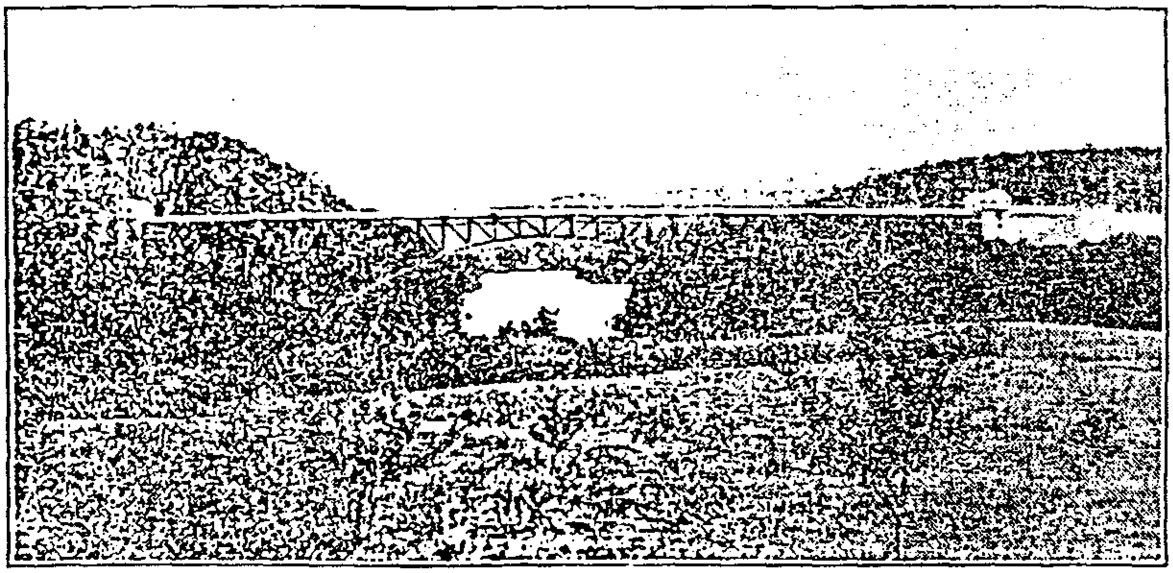
APPENDIX A.
Newspaper article relating the final phase of construction of the French King Bridge.
(The Daily Recorder-Gazette, July 8, 1932.)

SOUVENIR PROGRAM

On the Occasion of the

Dedication of the French King Bridge

Saturday, Sept. 10, 1932 at 2 P. M.



--- PROGRAM: ---

1:30 To 2 P. M.

Band concert by the Greenfield military band; (On the bridge).

2 To 3 P. M.

Speaking program (on the bridge): Frank E Lyman, commissioner of public work.

Joseph B Ely, governor of the commonwealth.

3 to 4 P. M.

Parade of highway transportation progress: American Legion drum and bugle corps, Greenfield, Company L Massachusetts National guard; Orange Howitzer company, Massachusetts National guard; Automobiles with county and town officials

Minute Tapioca band, Orange; Indian Travels Scene, Greenfield Boy Scouts, Oliver Cowles; Indian Travel's Scene, Millers Falls Redmen; Hunters and Trappers Scene, Northfield Farms Boy Scouts; Early Traders Scene, Millers Falls Boy Scouts, Scout Handicraft Scene, Living Boy Scouts, Rivermen and Legend Scene, Greenfield Boy Scouts, Child Life on the Farm (1850) "Mary P Wells Smith" Greenfield Woman's club; Early Singing School, Riverside Community [illegible]

Buckland - Colrain - Shelburne school band; Yoke of steers two wheel cart H. V. Hart [illegible]; Yoke of steers two wheel cart S T K [illegible]; Leyden [illegible] express covered wagon Mt Hermon school; stage coach John J. Wend-[illegible]; John F. Allen, one hoss shay, Mr and Mrs [illegible] Northfield; one hoss cabriolet [illegible] Greenfield on hoss cabriolet [illegible] Greenfield [illegible] Northfield hotel; Phil Potter horse-drawn freight wagon A F [illegible], L M Stanbridge [illegible], horse-drawn butcher cart, Oliver Cowles, Deerfield

Girl Scouts Drum corps, Greenfield; bicycle section, four high wheels; six safeties; auto section, four ancients; 12 moderns.

American Legion junior fife and drum corps, Amherst; Transportation section: Stake Side Auto Truck, Carroll Bros., Millers Falls; Freight Pick-up Van, B. & M. T. Co., Haigis, Turners Falls; Refrigerator Truck, J. G. Turnbull, Greenfield; Tank Truck and Trailer, S. C. of N. Y., Greenfield; Overland Passenger Bus, Short Line Bus Inc.; Road Builders Equipment, Kelleher Bros., Turners Falls; Road Maintenance Equipment, Mass. Highway Dept.

4 To 4:30 P. M.

Outboard motor races on the river finishing near the down stream side of bridge.

Airplane maneuvers in the air over the bridge by planes of Mass. National Guard.

Compliments of

THE DAILY RECORDER-GAZETTE

"FRANKLIN COUNTY'S ONLY DAILY NEWSPAPER"

APPENDIX B.
Souvenir Program from the French King Bridge Dedication and Celebration, September 10, 1932.

Historical Paper Prepared by John A. Taggart, Historian

Location of New French King Bridge One of Historical Interest --- Many Interesting Anecdotes --- Bridge Statistics

From the dawn of history mankind has been concerned with problems of travel and transportation. It has been truly said that "The means and methods of travel and transportation are a prerequisite of civilization."

We shall do well today to consider some of the problems which concerned those who first peopled this part of our fair Connecticut valley, from the settled and nomad tribes of red men to the first white men who made use of its land and water facilities as arteries of travel and transportation.

Before the coming of white men, this noble river around and above which we are gathered today offered the quickest and easiest passage-way between the homes of the northern tribes and the great salt waters on the south, hence it was the main north and south travel route through what is now western Massachusetts.

In due time a few restless souls with pioneering instincts left the somewhat inhospitable shores of the Atlantic waters on the east and faced forth westward through the unbroken forest seeking a place to found new homes.

The fertile open meadows along the broad river which we now know as "The Connecticut" were a spectacle which gladdened the hearts of the home seekers. These level tracts had annually been burned over by the red men until not a vestage of forestation remained, and here they had cultivated their corn and tobacco receiving abundant returns from the rich alluvial soil. Here were lands ready to cultivate without the labor of first clearing unbroken forest and here settlements were made.

The problem of transportation was a serious one to those early settlers. The river afforded a quick and convenient facility for north and south travel, but to the east and west it was quite another matter.

For generations the Indians had selected and adopted what to them seemed the most feasible trails in all directions and these trails the early settlers first made use of. The best known and most famous of those old trails was early known as the "Mohawk" from the fact that it led from the home of the "Pocumtucks" in this fair valley, over the western mountain to the home of the war-like "Mohawks" in what we now know as the "Mohawk valley."

This trail was made use of by the early whites as foot path, bridle path and post road, over which toiled the patient ox and the sweating stage horses until we of the present generation are enabled through the combined efforts and instrumentalities of towns, counties and the Massachusetts department of public works to see that ancient pathway covered by a modern highway which closely follows the original trail and perpetuates its name —The Mohawk trail—enabling all to enjoy the beautiful and inspiring views which a passage over it makes possible.

Our forefathers saw the passing of the trail the bridle path and pack horse the cart path and faithful ox and the post road with its "one hoss shay" and stage coach. They also witnessed the era of steam which brought the railroads and steamships crude at first but eventually developed as we see them today.

The generations of this period have seen the coming of the bicycle, the trolley car, the automobile and the airplane. We have also seen the passing of a large part of the sailing craft which once dotted the expanse of the seven seas and noted the substitution of steam and electricity as the motive power of water craft.

What the future holds in store for us in the way of transportation we know not. That is in the lap of the Gods. The effects of coming generations but we may point with pride to the victories thus far made in that oft-mentioned "prerequisite of civilization."

The particular task of the writer is to give something of the history pertaining to the territory adjacent to what will soon be known and spoken of from Maine to California and from the Canadas to the Gulf as the "French King bridge on the Mohawk Trail route."

Whence came the name French King and to what was the name given? There are several legends pertaining to the matter and like many another matter of history we are obliged to depend on legend for the answer.

An immense boulder situated in the middle of Connecticut river about one fourth mile above the new French King bridge has been known as "French King rock" since before the memory of living men. It was no doubt brought to its present resting place by the southward movement of a glacier in the far distant ice-age. Its dimensions have never been accurately determined, but in early days, before the dam at Turners Falls raised the level of the river waters, the rock stood over 16 feet above the surface of the water and was one of the most conspicuous objects in the whole length of the river.

Some idea of its weight, and powers of resistance to pressure may be had when it is realized that during the lifetime of those who have been familiar with its history, the rock has withstood the annual movements of ice which the spring freshets have brought to bear upon it, as well as the tremendous pressure of many log jams and has not been moved from its former position even the fractional part of an inch.

The Legend

During the French and Indian war, a party of French and Indians came down the Connecticut river on a scouting expedition, their object being to spy out the most desirable point to launch an attack at a later time. The party was under the command of a French officer. They reached the vicinity of the rock as the shades of night appeared. Being of no mind to attempt the passage of the rapids just below the rock in the dark, they made camp on the western bank opposite it.

The rock being the most conspicuous object which had attracted his notice, the officer wished to mention it in his report and fix it as something which might be referred to in the future, hence he staged a ceremony by lighting an altar fire on its top, sprinkled it with the water of the river and christened it French King in honor of his sovereign. The truth of this legend was vouched for by the late Solomon Caswell and also the late Caleb White; two of the last in this vicinity of the old rivermen, who regaled the writer with many tales of the activities upon and along Connecticut river during their remembrance.

Not only did the early days see steady though slow advance in land facilities for transportation, but the river as well was made more useful by the building of bridges, dams and canals.

It may not be inappropriate at this time to quote from an historical paper by Mr. Charles W. Hazelton of Turners Falls. "For over 200

years the Connecticut river was the main artery of travel and transportation between the towns and cities of the coast and nearly all the territory embraced by its watershed in Vermont, New Hampshire and western Massachusetts."

Naturally, the first assistance to navigation upon the waters of the Connecticut river were the establishment of canals and locks in order that the various natural falls and rapids might be safely passed by flat boats so called. For each canal a dam must be provided to furnish the necessary water to operate the locks. Records show that the dam, locks and canal at Windsor Locks were built in 1824. Those at South Hadley were built and opened in 1795. The Turners Falls locks and canals were opened for business in 1798 and those at Bellows Falls in 1802.

There was also a canal with one lock at "French King rapids." It began at French King rock and ended at a point just below the mouth of Millers river where the dam to furnish water for the lock was located. The canal was located on the Gill side of the river and at a point near where the lately constructed French King bridge spans the river, a house was constructed to accommodate the lock tender. That house has sometimes been mistakenly called a hotel. The hotel was on the opposite side of the river and was for many years known as The Durkee tavern of which more anon.

Quoting further from Mr. Hazelton's narrative it appears that after the opening of the canals at Turners Falls and French King rapids. "For the next forty or fifty years a very prosperous business was carried on, but in 1846, when the Connecticut river railroad was built to Greenfield, and began the transportation of travel and merchandise, the business of the canals very rapidly diminished, until they did not pay for their operation, the last boat going through the locks in 1856. From that time until 1865, the old canals were going to decay as to their locks and dams, and the canal beds were growing up to brush."

In 1835 the old Locks and Canal company's franchise and property was acquired by outside interests. A new company, The Turners Falls company, was organized. That company was, by act of the legislature, relieved of the obligation to maintain the old canals for navigation purposes and empowered to build and maintain a dam for power purposes. Mr. Hazelton states, "This dam was the fourth to be built at that point since 1793." He further states "Timothy M. Stoughton, born in 1818, and for 90 years a resident of Riverside, said to me that he had seen three dams, either carried out or seriously injured by ice freshets before this dam of 1866 was built."

Thus was closed the colorful chapter in which the old locks and canals played their parts in river navigation in this vicinity.

The present concrete dam at Turners Falls being much higher than its predecessor, raised the level of the river to a point well above French King rock, submerging all traces of the old canal and leaves only a small portion of the French King rock above water.

Now let us turn from the river and note briefly some of the improvements in land facilities for travel and transportation in this vicinity.

As time went on it was evident that fords and ferries could not properly accommodate the requirements of east and west land transportation and bridges were built at various points in this vicinity.

One of the first to span the Connecticut river was at what is now Montague City. It was situated near the site of the present covered bridge. It was a crude affair of wooden arches. The flooring followed the contour of the arches, so that in crossing it, one must needs pursue an up and down course. Sometime later (exact date unknown) this bridge fell while a drove of cattle were crossing it. Among the cattle was a mounted horseman who went down with the cattle and strange to relate both horse and man were saved though many of the cattle were lost.

At that early date even as now, it was deemed appropriate to celebrate the opening of a new bridge. The late George Andrews of Montague City told of the celebration which was held at the opening of that bridge, he receiving the details from the lips of his grandfather, the late Elijah Alvord.

That bridge was replaced by another of more substantial construction which gave way to others previous to the construction of the present covered bridge which was built in 1869 by the late Aaron Wright of Greenfield from plans drawn by the late Jason I. Carlisle of Greenfield.

From the records of the late Lyman Gilbert of Northfield Farms it appears that early in 1869 he assisted in building a bridge across Millers river near its mouth, presumably at or near the site of the present iron bridge. It is related that Mr. Gilbert had the good fortune to safely cross the partly finished bridge with his heavily loaded ox cart just a moment before it collapsed.

With the coming of bridges the old cart roads were improved to accommodate stages and horse and ox drawn freight wagons.

Passing beneath the French King bridge which we dedicate today, we see the old "east side" stage road over which passed the Hartford to Brattleboro stages in the long ago. The "west side" route was through Greenfield, Bernardston and Guilford, Vt.

On the level tract just westerly of the mouth of Millers river, stood the famous Durkee tavern which dispensed cheer to river boatmen, log drivers, and the large traffic of the stage road. At this hospitable institution the stage changed horses coming and going, the drivers of the ox and horse drawn freight trains "put up" for the night as did many a horseman and foot-sore wayfarer. Its first landlord is unknown, but its second was Thomas Durkee. He was landlord for several years and his mantle fell upon the shoulders of his son Jeremiah who had a long and successful career as owner and manager, conducting the affairs of the tavern in a manner which made it known afar.

But the world moves on, the march of progress may not be stayed. "One generation cometh and another generation passeth away." Our forefathers left us a goodly heritage and made possible many of the privileges which we enjoy today. These beautiful, wooded hills which adjoin the highway and bridge which we here dedicate looked down upon a scene of great activity in the faraway days of which we have written. They saw much which the present generation may only see through the eyes of legend and written history. No more may be seen the dusky warrior and his frail craft of birchen bark. No more may be heard the songs of the old river boatmen as they floated down the river or toiled upriver in their cumbersome crafts, aided by the "white ash breeze." No more may be heard the mellow tones of the coach horn as it warned the hostlers at Durkee's tavern to have fresh horses in readiness. No more may we of today see the red-shirted spike-shod log driver as he balanced gracefully, peavy in hand, upon the treacherous floating log and "shot the rapids" in a spirit of bravado, or sought courageously for the elusive "key log" in a jamb on French King rock.

Those men of early days were devoid of all pretense, possessed of a spirit which knew only contempt for danger, and a tenacity of purpose which enabled them to hold their own among a race of hard working—and sometimes hard fighting—men, who notwithstanding their few vices, were possessed of an abundance of those homely virtues which we of today may well strive to emulate.

In the words of another we might add, "Where are ye oh fearless men?

Where are ye today? I call, the hills reply again that ye have passed away."

And so let us ring down the curtain on acts and scenes of the past, and give our attention to the present. This is a period which has seen wonderful development in transportation; so much so that there is no longer an isolated country or an isolated community. The automobile and the airship have penetrated the former unexplored wilds of the earth. The balloon has searched the mysterious heights of the stratosphere, and the submarine has visited the watery depths of "Davy Jones' locker." Who dares say that the wildest dreams of Jules Verne may not yet come true.

The earth is girdled with steel rails and modern highways beckon where the legions of Caesar, Alexander and Napoleon once struggled through mire or over rock-strewn heights.

We consider with pride the splendid highway systems of Massachusetts. Today we dedicate a magnificent addition to the justly famous Mohawk Trail system. The imposing structure of steel and concrete which here spans the Connecticut river is a noble monument to man's skill and ingenuity. The miles of newly constructed highway which approach the bridge from west and east open up a territory rich in history and replete with views which delight the eyes.

Let us feel assured that coming generations will appreciate that we have builded not for ourselves alone, but also for those who shall people this fair valley after the builders have passed to that bourne from whence no traveler returns.

Statistics

French King bridge has the unique distinction of being the only bridge of its particular type in Massachusetts and so far as known, the only one in this country.

It was designed in the Bridge Engineer's Department of the Massachusetts Department of Public Works.

During the first period of its erection it was of the cantilever type. It remained such until its two cantilever sections were joined at the center, when it ceased to be a cantilever and became what is termed "A deck spandrel, braced arch, with supported cantilever ends."

Length of steel construction, 783 feet.

Height from floor to mean low water, 139 feet.

Weight of steel, 2,606 tons.

Weight of concrete floor, 2,186 tons.

Weight of bituminous floor finish, 442 tons.

Abutments contain 6500 yards of concrete.

Width of roadway, 40 feet.

Width of sidewalk, 5 feet.

Approximate cost of bridge and abutments, $375,000.

Total cost of the whole cut-off from Millers Falls to Greenfield including the bridge will be approximately $950,000.

COMMITTEE CHAIRMEN
ON FRENCH KING BRIDGE CELEBRATION

General Chairman - J. B. KENNEDY
General Secretary, EDWARD M. AYER
Reception - - - JOHN W. HAIGIS
Program - - - ROBERT P. DOLAN
Music - - - - PERCY C. ROBERTS
Marshal - - - - MYRON STEVENS
Boat - - - - - CARL F. ELRICH
Float - - GEORGE W. PILLSBURY
Publicity - - - PAUL C. BELKNAP
Militia - CAPT. COLLIN H. KILBURN
Airplane - - GEORGE W. WILCOX
Automobile - - EDWARD H. NOLAN
Receiving Stand, ELWYN L. STREETER
Finance - - - STANLEY B. WOODS

PRIZE BRIDGES

1928–1938

AISC

AMERICAN INSTITUTE of STEEL CONSTRUCTION, Inc.
One Hundred One Park Avenue · New York, N. Y.

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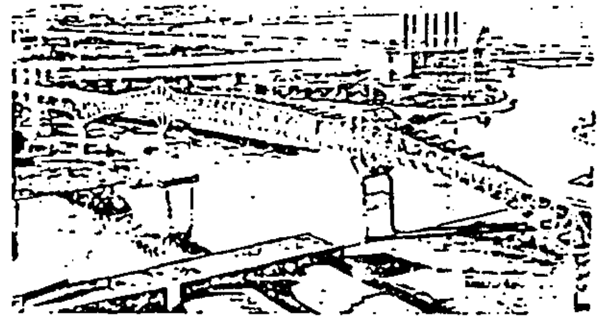

FIRST PLACE—CLASS A—1932 AWARD

PULASKI SKYWAY—Crossings of Hackensack and Passaic Rivers, Hudson County, N. J.; Total Cost, $1 100 000; Engineer, Jacob L. Bauer, State Highway Engineer; Fabricators, McClintic-Marshall Corporation; Owner, State of New Jersey; Completed November 24, 1932; Span length: channel span, 550 ft.

FIRST PLACE—CLASS B—1932 AWARD

FRENCH KING BRIDGE—Towns of Erving and Gill, State of Massachusetts, Mohawk Trail, Route 2, over Connecticut River about six miles east of Greenfield, Mass.; Total Cost, $385,000 (exclusive of property damages and approaches); Engineers, A. W. Dean, Chief Engineer; C. E. Harkness, Bridge Engineer, Massachusetts Department of Public Works; Fabricators, McClintic-Marshall Corporation; Owner, Commonwealth of Massachusetts; Opened to travel September 10, 1932; Span: 460 ft. center to center pins of center span; 782 ft. center to center of end pins; 890 ft. out to out of abutments.

FIRST PLACE—CLASS C—1932 AWARD

BRYAN BRIDGE—Valentine, Nebraska, over the Niobrara River, Federal Highway No. 20; Total Cost, $51,650.08 (contract price); Engineer, Nebraska Department of Public Works, J. G. Mason, Bridge Engineer; Joseph Sorkin, Designer; Fabricators, Paxton & Vierling Iron Works; Owner, State of Nebraska; Completed September 30, 1932; Span length: 115 ft. 2½ in. central cantilever arch span, anchor arm spans, 75 ft. each

APPENDIX C.
AISC Awards brochure, 1932.

ENDNOTES

1. Souvenir of the Mohawk Trail, Massachusetts (Mechanicville, N.Y., 1925), p.1.

2. William B. Browne, The Mohawk Trail: Its History and Course (Pittsfield, Mass., 1920), pp.21-25.

3. Josiah Gilbert Holland, History of Western Massachusetts, vol. 1 (Springfield, 1855), p.313.

4. Acts of Massachusetts, 1797.

5. Frederic J. Wood, The Turnpikes of New England (Boston, 1919), p.69.

6. Ibid, p.103.

7. Souvenir of the Mohawk Trail, and Annual Report of the Massachusetts Highway Commission, 1915 (Boston, 1915).

8. Albert E. Kleinert, Jr., "Design and Construction of the French King Bridge On the Mohawk Trail Route Across the Connecticut River, Massachusetts," Journal of the Boston Society of Civil Engineers, June, 1933, pp.117-118.

9. Annual Report of the Massachusetts Department of Public Works, 1931 (Boston, 1931).

10. Acts of Massachusetts, 1931, pp.96-98.

11. Annual Reports of the Massachusetts Department of Public Works, 1930-33 (Boston, 1930-33).

12. For more information on the history of hydro-electric development in the Connecticut River valley, see HAER No. MA-107: Eleventh Street Bridge, Turners Falls.

13. Kleinert, p.121.

14. Ibid, pp.127-128.

15. Ibid, pp.128-129.

16. The Daily Recorder-Gazette, Greenfield, Mass., May 4, 1932.

17. Ibid, June 21-July 1, 1932.

18. Ibid, July 8, 1932.

19. Ibid, July 13, 1932.

20. Ibid, July 22, 1932.

21. Kleinert, p.135.

22. Recorder-Gazette, August 20, 1932.

23. Ibid, August 29, 1932.

24. Ibid, September 6, 1932.

25. Ibid, September 12, 1932, p.7.

26. Ibid, September 12, 1932, p.1.

27. "Souvenir Program on the Occasion of the Dedication of the French King Bridge," The Daily Recorder-Gazette, September 10, 1932.

28. Boston City Directories.

29. Boston City Directory, 1932.

30. "McClintic, Howard Hale," biographical sketch, in The National Cyclopaedia of American Biography, vol. 29 (New York, 1941), p.95.

31. Ibid.

32. Ibid.

33. "Bethlehem Enters Pittsburgh," Post-Gazette, Pittsburgh, Pennsylvania, February 7, 1931.

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Historic photo collection of the construction and dedication of the French King Bridge, Harry W. Fay, New Salem, Mass., photographer. Private collection of Dr. Ward M. Hunting, New Salem, Massachusetts.

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